

squamula and front half of squama are white rather than yellow. Agrees with description in having abdomen wholly ferruginous or rufous, with no black on median line or tip. Say's description applies so closely that I feel practically no doubt in the identification. But in order to avoid all future doubt as to the identity of the present genus, the species is described as new.

Holotype, Cat. No. 20800, U. S. Nat. Mus., TD499.

The holotype was opened in 1908 and the eggs removed. The latter are elongate, elliptical, fully two and one-half times as long as wide, thick, slightly flattened on one side, thus unlike those of *Trichiopoda* and *Xanthomelanopsis*.

*Phorantha fenestrata* Bigot.—*Phorantha bridwelli* Hine and *Phasia phasiatrata* H. E. Smith are synonyms of this species. The species appears to be, at least on the female, a true *Phorantha*, in which case *Paraphasia* falls to that genus.

*Imitomyia sugens* H. Loew.—*Saskatchewania canadensis* H. E. Smith is the long-lost *Himantostoma sugens* of Loew. The species seems to have become very scarce in the southern part of its original range, if it has not died out altogether there.

## LITHOHYPODERMA, A NEW FOSSIL GENUS OF OESTRIDS

By CHARLES H. T. TOWNSEND

In 1877 Scudder, in the Bulletin of the U. S. Geological and Geographical Survey of the Territories, III, 756–8, described certain fossil muscoid maggots found by Mr. W. Denton in the White River shales of the Chagrin Valley, Colorado. Several forms were distinguished and names proposed for four of them, the most abundant form being named *Musca ascarides*. In 1890, in the Tertiary Insects of North America, 551–4, Pl. 5, Scudder quoted the original descriptions of these forms and figured them.

The United States National Museum collections contain a large series of these fossil maggots. The best of them are from the Roan Mountains, Colorado, collected by Scudder, and from

Hay Gulch, Colorado, collected by Mr. D. E. Winchester. In 1908 I examined the Roan Mountains material without being able to come to any definite conclusion as to the affinities of these maggots, other than that they were probably muscoid.

In 1916 Cockerell, in the Proceedings of the U. S. National Museum, LI, 91-2, Pl. 2, referred *Musca ascarides* to *Hypoderma*, gave additional details of its characters and figured it. He examined additional material from the Green River shales of eastern Utah. Credit is due him for first recognizing the undoubted æstrid affinities of this maggot. I have now made a careful study of the National Museum material, in the light of Cockerell's findings, and am forced to the conclusion that the form is markedly distinct from *Hypoderma*. The characters of the new genus can be well set forth in the maggot and puparium, and the genus may be advantageously recognized at this time.

**Lithohypoderma**, new genus.

Genotype, *Musca ascarides* Scudder, 1877, Bull. U. S. Geol. & Geogr. Surv. Terr., III, 756-7; and 1890, Tert. Ins. No. Amer., 551.

Differs from *Hypoderma* in the third-stage maggot possessing six subcircular spinuliferous pads on dorsal surface of intermediate segments, arranged as follows: Two pads occupy center of hind portion of segment, with two similar ones on each side a little in advance of the central pair, the six disposed in an irregular transverse band. These are figured by Cockerell, but are more nearly circular than shown in his figure. In front of the central pair is a transversely elongate pad bearing similar minute spines, which does not appear in Cockerell's figure. The segments bear in addition narrow transverse areas of small spines along hind margin, as in *Hypoderma*. The small polished dorsal tubercles of *Hypoderma*, two in middle and one on each side of segment, appear to be absent. Heavy short flattened spines with broad bases appear on the anterior segments, as in *Hypoderma*. The anal stigmata are of the same general plan as those of *Hypoderma*, but the sculpture is finer, the button is smaller, and the lines radiating from

the button appear to be absent. The cephalopharyngeal skeleton shows well in numerous specimens as a V-like mark with the hypostomal sclerite wedged in the base of the V. The details can not be made out satisfactorily, owing to the pressure that has been exerted on the skeleton, massing the sclerites together and distorting or obscuring their outlines. The pharyngeal sclerites are well elongated, and the hypostomal heavy. The two mandibular sclerites appear to be elongate, sharp, and nearly straight.

The pupa is distinguished from that of *Hypoderma* by the strongly tuberculate lateral borders, as photographed and figured by Cockerell.

The examination of the shales in the National Museum collection shows that anal stigmatal plates and cephalopharyngeal skeletons are numerously represented and scattered in various places among the remains. There are a few excellently preserved specimens of nearly the whole maggot. In at least two specimens of the latter, one being both figured (fig. 4) and photographed (fig. 6) by Cockerell, the two main tracheal trunks can be very clearly seen, and even the delicate spirals of chitin which supported the tracheal walls in life are plainly visible and perfectly preserved. In numerous cases the chitin of the maggot integument and puparium is preserved in the shales unchanged since the Eocene, during the lapse of a period of time probably not less than two million years.

It seems safe to assume that *Lithohypoderma* was a subcutaneous bot of some North American Eocene bovine, most probably the ancient progenitor of the modern bison. The large numbers in which the bots occur in the shales is easily explained by their dropping from the host at places where the latter congregated to water.